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## ABSTRACT

## A method and apparatus for producing meat products

A coarse grinder (1) is used to grind raw lean meat and meat fat trims. Coarse ground raw lean meat is emulsified in an emulsifier (6) to a nominal size of less than 1 mm before delivery to a mixer (10,11). Coarse ground meat fat trims are delivered into the mixer (10,11) along with other ingredients. After mixing, the mixture is finally ground to a nominal size of from 3.2 mm to 5 mm. The in-process emulsification of the coarse ground raw lean meat allows meat blend products to be produced in which the ingredient size and organoleptic properties can be optimised in a substantially continuous process. <Fig.1>

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"A METHOD AND APPARATUS FOR PRODUCING MEAT  
PRODUCTS"

5      Introduction

There are various technologies available for producing blended meat products such as pepperoni, salamis and the like.

10     Generally, such products contain a mixture of raw lean meat and fat meat trims together with various spices/flavourings.

In one known method of production raw lean meat and meat fat trims are coarse ground, mixed with other ingredients, and blended.

15     While this method is efficient in terms of production as the process can be carried out essentially continuously, there are problems because the range of meat products that can be manufactured in this way is limited.

20     It is also known to use a bowl chopper to produce blended meat products of this type on a batch basis. In this process generally raw lean meat is added to the bowl chopper in a first step, ground to a desired size, and then fat meat trims are added. Because the fat meat trims may be ground less than the raw lean meat the process has greater flexibility as regards the range of products which can be produced.

25     However, there are major problems with such a process. Because of the batch nature of the process it is inefficient and does not facilitate the production of products of repeatable/reproducible quality. The end product is variable because of the necessity for operator control and intervention. In addition, such bowl choppers are expensive to purchase and maintain. There are also considerable difficulties in cleaning such machines to a high standard because the machine has a number of crevices which are extremely difficult to access for cleaning.

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There is therefore a need for an improved process for producing meat blend products.

**Statements of Invention**

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According to the invention there is provided a method for producing a meat blend product comprising the steps of:

coarse grinding raw lean meat;

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delivering the coarse ground raw lean meat into a raw lean meat receiving bin;

coarse grinding fat meat trims;

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delivering the coarse ground fat meat trims into a fat meat trims receiving bin;

blending the coarse ground fat meat trims in the fat meat trims receiving bin;

20

blending the coarse ground raw lean meat in the raw lean meat receiving bin;

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delivering the blended coarse ground raw lean meat to an emulsifier to further grind the raw lean meat to a desired size;

delivering the emulsified raw lean meat to a mixer;

delivering the coarse ground fat meat trims to the mixer;

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adding other desired ingredients to the mixer;

mixing the mixture thus formed in the mixer; and

final grinding of the mixture.

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In one embodiment of the invention the raw lean meat is coarse ground to a nominal size of from 10 to 13mm. Preferably fat meat trims are coarse ground to a nominal size of from 10 to 13mm.

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In a preferred arrangement the emulsified raw lean meat has a nominal size of less than 1mm. Preferably the mixture is finally ground to a nominal size of from 3mm to 5mm, most preferably approximately 4mm.

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The raw lean meat preferably has less than 30% fat and the fat meat trims typically has more than 50% fat.

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In a particularly preferred embodiment of the invention the emulsified raw lean meat is warmed as it is delivered from the emulsifier for supply to the mixer. Preferably the emulsified raw lean meat from the emulsifier is delivered through a delivery pipe for supply to the mixer, the delivery pipe being jacketed for circulation of warming fluid.

25

In one embodiment of the invention the coarse ground raw lean meat is delivered to one of a number of separate raw lean meat receiving bins for delivery, after blending, to a common emulsifier. Preferably also the coarse ground fat meat trims is delivered to one of a number of separate fat meat trims receiving bins for delivery, after blending, to a mixer.

30

Ideally there are at least two mixers to provide substantially continuous production of the meat blend.

In another aspect the invention provides an apparatus for producing a meat blend product comprising:

a course grinder for grinding raw lean meat and fat meat trims;

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a raw lean meat receiving bin for receiving coarse ground raw lean meat from the coarse grinder;

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a fat meat trims receiving bin for receiving coarse ground fat meat trims from the coarse grinder;

a raw lean meat blender for blending the raw lean meat in the raw lean meat receiving bin;

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a fat meat trims blender for blending the fat meat trims in the fat meat trims receiving bin;

an emulsifier for further grinding the raw lean meat to a desired size;

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a mixer for mixing the emulsified raw lean meat and coarse ground fat meat trims and other desired ingredients;

a delivery means for delivery of the emulsified raw lean meat to the mixer; and

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a grinder for final grinding of the mixture from the mixer.

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Preferably there are a number of separate raw lean meat receiving bins and fat meat trims receiving bins for receiving coarse ground raw lean meat or fat meat trims from the coarse grinder.

Preferably the raw lean meat receiving bins have a common blended raw lean meat outlet line for delivery of the blended raw lean meat to the emulsifier.

In one embodiment of the invention the apparatus includes means for cooling the  
5 emulsified raw lean meat as it is delivered from the emulsifier for supply to the mixer.

Preferably the cooling means comprises a jacketed delivery pipe for circulation of warming fluid.

10 In a preferred arrangement there are at least two mixers to which the emulsified raw lean meat and coarse ground fat meat trims may be led.

#### Brief Description of the Drawings

15 The invention will be more clearly understood from the following description thereof given by way of example only, in which:-

20 Fig. 1 is a diagrammatic plan view illustrating processing apparatus used in the method of the invention;

Fig. 2 is a perspective view of part of the apparatus of Fig 1; and

Fig. 3 is a plan view of part of the apparatus of Fig. 1.

25

#### Detailed Description

Referring to the drawings and initially to Fig. 1 thereof there is illustrated  
30 apparatus for use in a method for producing a meat blend product such as a salami, pepperoni or similar product.

The apparatus comprises a coarse grinder 1 for grinding raw lean meat and fat meat trims. Ground raw lean meat from the coarse grinder 1 is delivered along a delivery line 2 to one of a number of, in this case three, raw lean meat receiving bins 3. Each of the bins 3 has a raw lean meat blender for homogenising the coarse ground raw lean meat in the bin 3 to provide a uniform raw lean meat coarse ground product which is delivered through outlet lines 4 and a common raw lean meat delivery line 5 to an emulsifier 6. Ground fat meat trims from the coarse grinder 1 is delivered along the delivery line to one of a number, in this case three, fat meat trims receiving bins 7. Each of the bins 7 has a fat meat trims blender for homogenising the coarse ground fat meat trims in the bins 7 to provide a uniform fat meat trims ground product which is delivered through outlet lines 8 to an intermediate supply line 9 for feeding one of two mixers 10, 11. The emulsifier 6 is used to emulsify the raw lean meat to a desired size, typically less than nominal 1mm for delivery into the intermediate supply line 9 to one of the mixers 10, 11. Other desired ingredients such as spices and salt may be added to the mixture in the mixer 10, 11, and after mixing, the mixed meat blend product is delivered along an outlet line 12 to a final grinder 13 for final grinding of the mixture.

The raw lean meat is typically pork or beef with a fat content of less than 30%. The raw lean meat is typically coarse ground at a temperature of from -2°C to -4°C to a nominal size of from 10 to 13mm. The raw lean meat after coarse grinding in the grinder 1 and blending in the raw lean meat receiving bin 3 is emulsified at a temperature of about 0 to -2°C to a nominal size of less than 1mm, before delivery along the intermediate line 9 into the appropriate mixer 10, 11. After mixing the raw lean meat, fat meat trims and other ingredients in the mixer 10 or 11, the mixture is delivered to the final grinder 13 in which the mixture is finally ground to a nominal size of from 3.2mm to 5mm, usually approximately 4mm.

The purpose of blending the meats is to homogenise the batch of meat so that a representative sample can be analysed and so that a representative weight can be taken from the blender to constitute a batch of finished product following analysis. The analysis determines the make-up of the batch according to the required customer specification for fat / moisture / protein.

Referring particularly to Figs. 2 and 3 the coarse ground raw lean meat blended in the bins 7 is delivered through the outlets 4 onto a delivery conveyor 5. A plough 20 at the end of the delivery conveyor 5 directs the blended coarse ground raw lean meat into a feed hopper 21 from which the raw lean meat is delivered through emulsifier plates 22. The emulsified raw lean meat is then pumped by a pump 25 along an emulsified raw lean meat delivery pipe 26 to the intermediate delivery conveyor 9 for feeding to one of the mixers 11, 12. The delivery pipe 26 is jacketed and a liquid such as water at about 10°C is circulated through the jacket to warm the emulsified raw lean meat slightly to assist the flow of the emulsified raw lean meat through the delivery pipe 26.

The method and apparatus of the invention may be used to produce a wide range of meat blend products such as salamis, pepperoni, meat blend toppings and the like. The method and apparatus facilitates the preparation of a wide range of meat blend products in a highly efficient manner. The in-process emulsification of the coarse ground raw lean meat is particularly advantageous in producing meat blend products in which the ingredient size and organoleptic properties can be optimised in a substantially continuous process.

One particularly important advantage of the invention is that the raw lean meat portion can be ground more finely than has been possible to date. When the fat meat trims are combined with the fine ground raw lean meat the total mixture is ground less than if the meat fat trims and raw lean meat were ground together. Thus, the raw lean meat is ground less and the fat meat trims are ground more than has heretofore been possible.

In terms of the meat blend product, because the fat is less dispersed the product is firmer. In addition, because the raw lean meat is finer ground the protein in the lean may be more efficiently extracted by added salt to the mixer. This also makes the product firmer. Firm products are generally desirable because of perceived higher eating quality, better cooking quality, and ease of further processing, for example by dicing or slicing.

Many variations on and modifications to the invention will be apparent and accordingly the invention is not limited to the embodiments hereinbefore described which may be varied in detail.

CLAIMS

1. A method for producing a meat blend product comprising the steps of:-

5 coarse grinding raw lean meat;

delivering the coarse ground raw lean meat into a raw lean meat receiving bin;

10 coarse grinding fat meat trims;

delivering the coarse ground fat meat trims into a fat meat trims receiving bin;

15 blending the coarse ground fat meat trims in the fat meat trims receiving bin;

blending the coarse ground raw lean meat in the raw lean meat receiving bin;

20 delivering the blended coarse ground raw lean meat to an emulsifier to further grind the raw lean meat to a desired size;

delivering the emulsified raw lean meat to a mixer;

25 delivering the coarse ground fat meat trims to the mixer;

adding other desired ingredients to the mixer;

30 mixing the mixture thus formed in the mixer; and

final grinding of the mixture.

2. A method as claimed in claim 1 wherein the raw lean meat is coarse ground to a nominal size of from 10 to 13mm, preferably the fat meat trims is coarse ground to a nominal size of from 10 to 13mm, preferably the emulsified raw lean meat has a nominal size of less than 1mm, preferably the mixture is finally ground to a nominal size of from 3mm to 5mm, preferably the mixture is finally ground to a nominal size of approximately 4mm, preferably the raw lean meat has less than 30% fat, preferably the fat meat trims has greater than 50% fat.
3. A method as claimed in claim 1 or 2 wherein the emulsified raw lean meat is warmed as it is delivered from the emulsifier for supply to the mixer, preferably emulsified raw lean meat from the emulsifier is delivered through a delivery pipe for supply to the mixer, the delivery pipe being jacketed for circulation of warming fluid.
4. A method as claimed in any preceding claim wherein the coarse ground raw lean meat is delivered to one of a number of separate raw lean meat receiving bins for delivery, after blending, to a common emulsifier, preferably the coarse ground fat meat trims is delivered to one of a number of separate fat meat trims receiving bins for delivery, after blending, to a mixer, preferably there are at least two mixers to provide substantially continuous production of the meat blend.
5. A meat blend product whenever produced by a method as claimed in any preceding claim.

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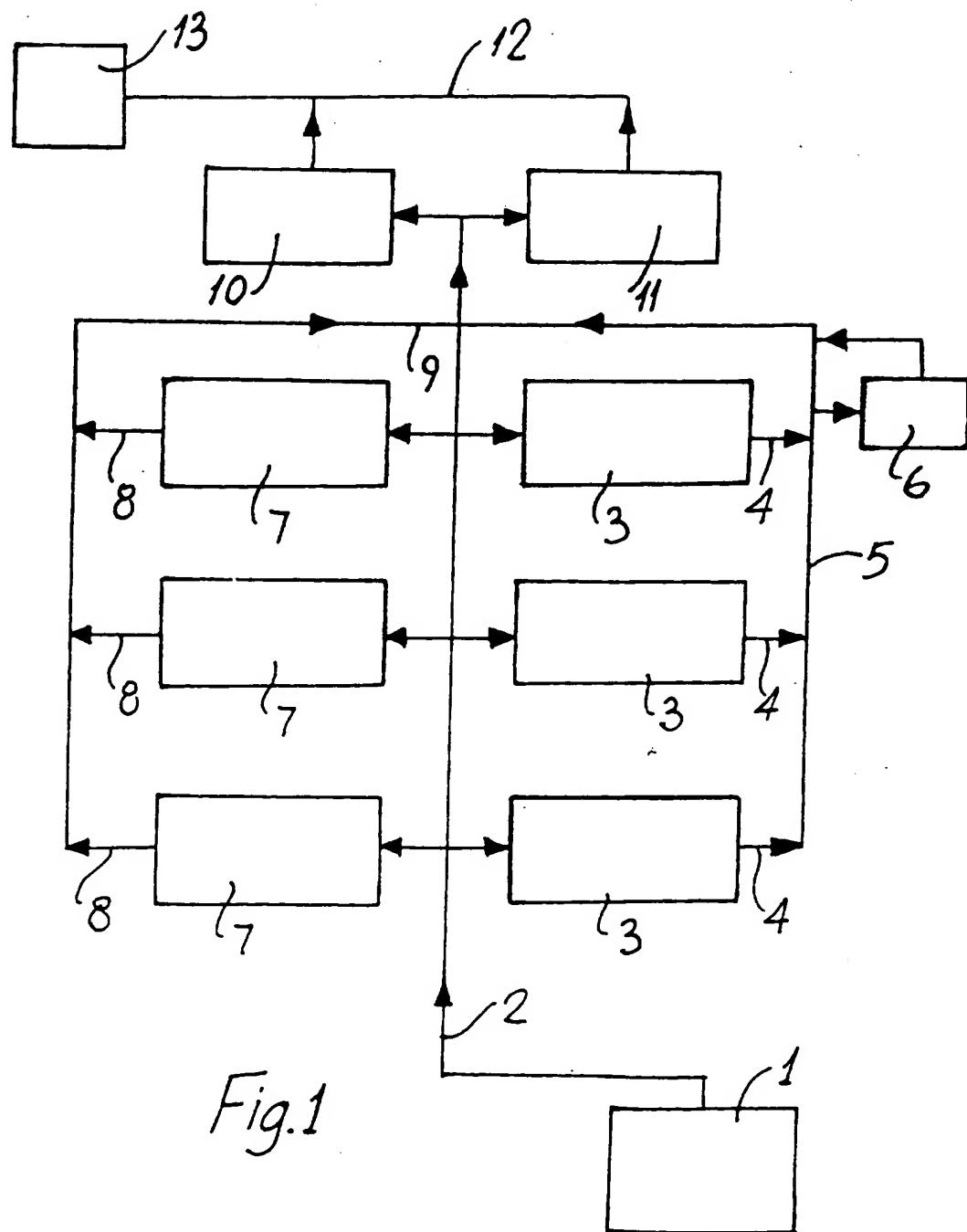
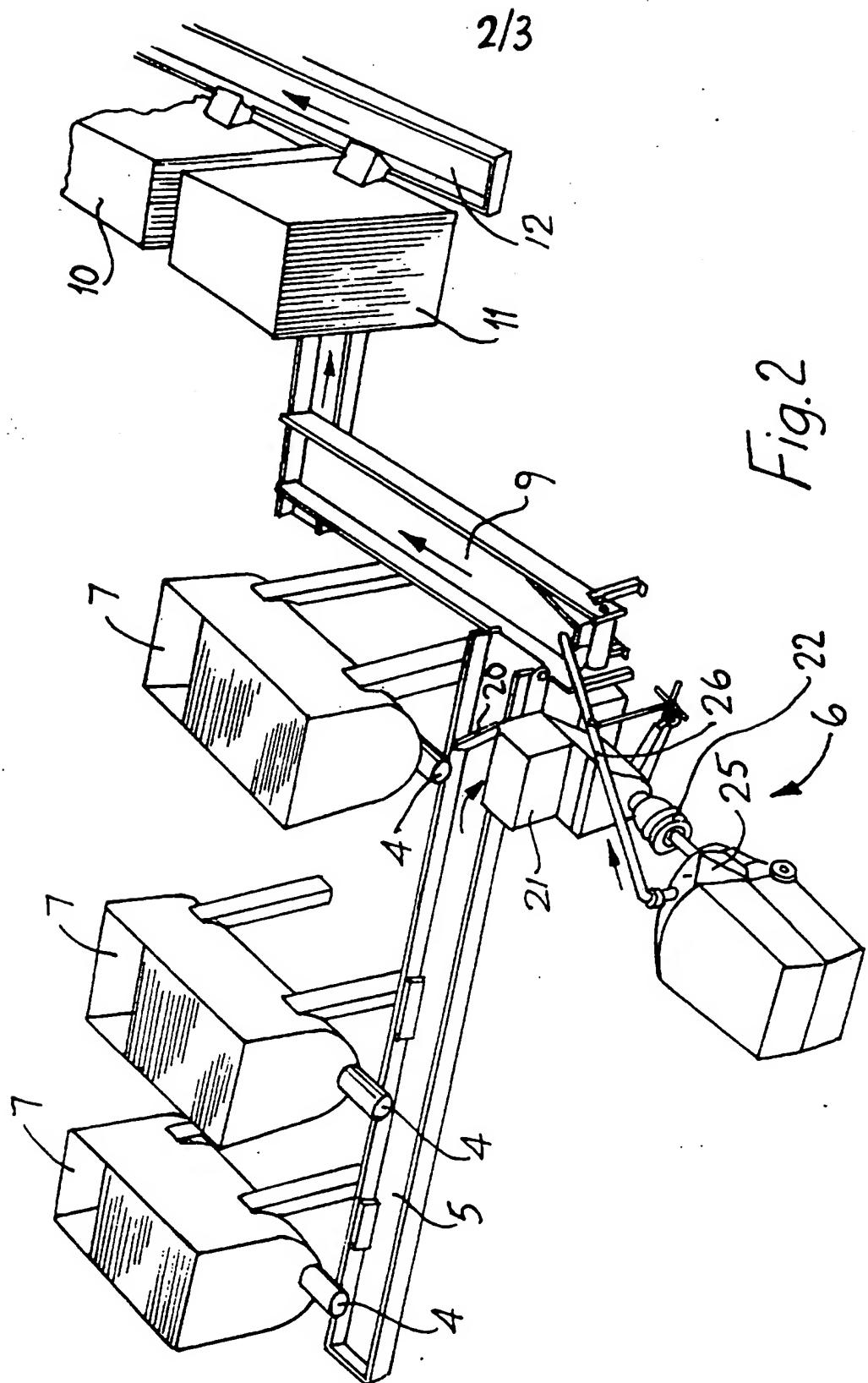


Fig.1

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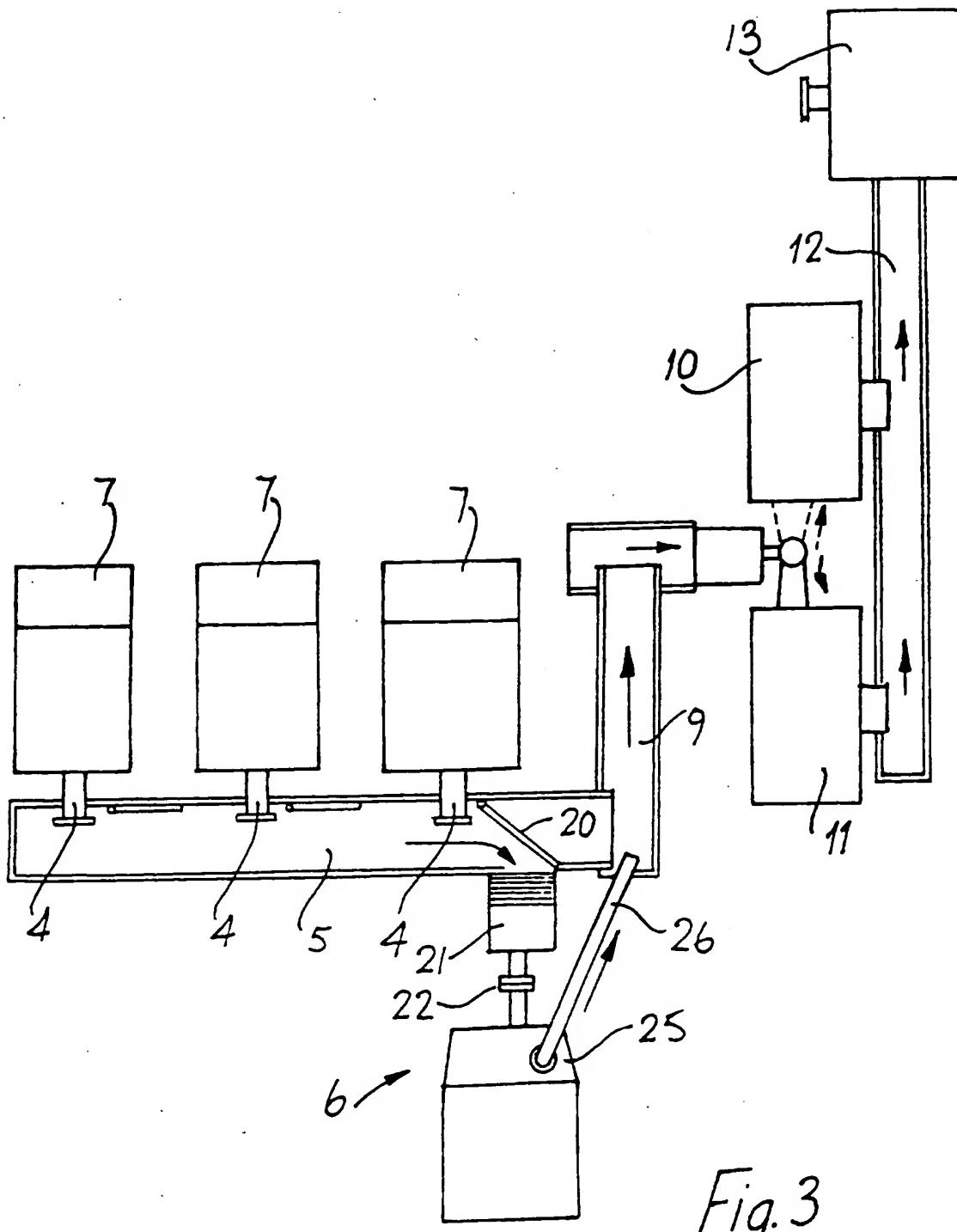


Fig. 3